MIT 4.562 4.502 Fall 2024 Assignment 3

Lab Instruction Part 3:

VR Interactive Interface using Gravity Sketch

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Last modified : 2024/10/06

B. Gravity Sketch Manual

Step 1: Log in on your computer and VR headset

1. We can access Gravity Sketch on your computer here: https://landingpad.me/user/files
2. You can use our lab's Gravity Sketch accounts to log in:
   Email: mitdescomp@gmail.com
   Password: 7304adminMIT
   or
   Email: tuhan_arch@outlook.com
   Password: 7304adminMIT
   or
   Email: hantu0417@gmail.com
   Password: 7304adminMIT

Step 2: Edit and export models

1. Edit your scanned models in Rhino 8 or other modeling software. The most common file format from Metashape or Autodesk Recap is .obj, which contains a .obj model file, a .mtl material description, and in most cases, a .jpeg texture file. When importing .obj into Rhino, please make sure that all these files are present for a model.
   ***Attention**: Rhino 8 is the only Rhino version that can import .glf, which would be exported from Polycam. Rhino 8 download and license information can be accessed through MIT's STOA website (as of 2024): https://stoa.mit.edu/applications*
2. Compose your scanned models in the position and scale you want.
3. Make sure each of your models in each layer is less than **60k polygons, 30MB, with texture in the format of JPG**.
4. Export your model using **FBX format**.

Step 3: Import OBJ and FBX files with materials/textures

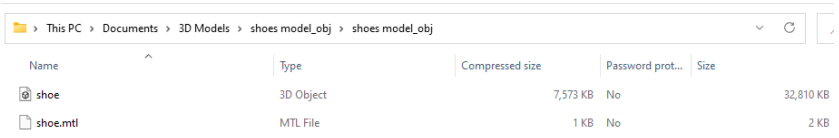
1. By uploading them to LandingPad. Log into your account on landingpad.me. Select the plus button on the top right. Then select the Upload button to upload the files. Alternatively, you can drag and drop the files. See more tutorials about importing models here.

   OBJ file format

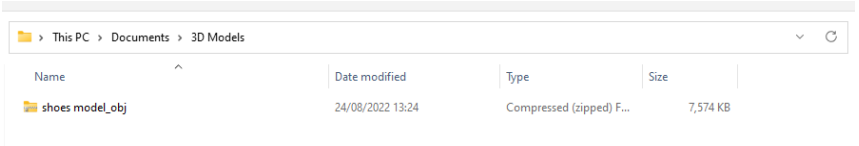
   To import materials with your OBJ files, make sure the MTL file is zipped in the same folder as the OBJ file. Then import the zipped folder as usual (check instructions for importing **here**).

   Example:

   Content of the compressed folder. Please ensure only the OBJ & MTL are zipped and not within another file.



   Compressed folder ready to import



FBX file format

FBX files work a bit differently. The textures will need to be embedded into the file itself so make sure that's done before you import the FBX files to Gravity Sketch.

Other format in VR:

Import 3D: GRS, OBJ, FBX, IGS/IGES, STL, GLTF/GLB, Collada (DAE)

Import 2D: JPG, PNG, HDR, MP4

Import fonts: OTF/TFF

Export 3D: OBJ, FBX, IGES, GRS (when using the Save option)

Export 2D: PNG (screenshots)

More importing format information here.

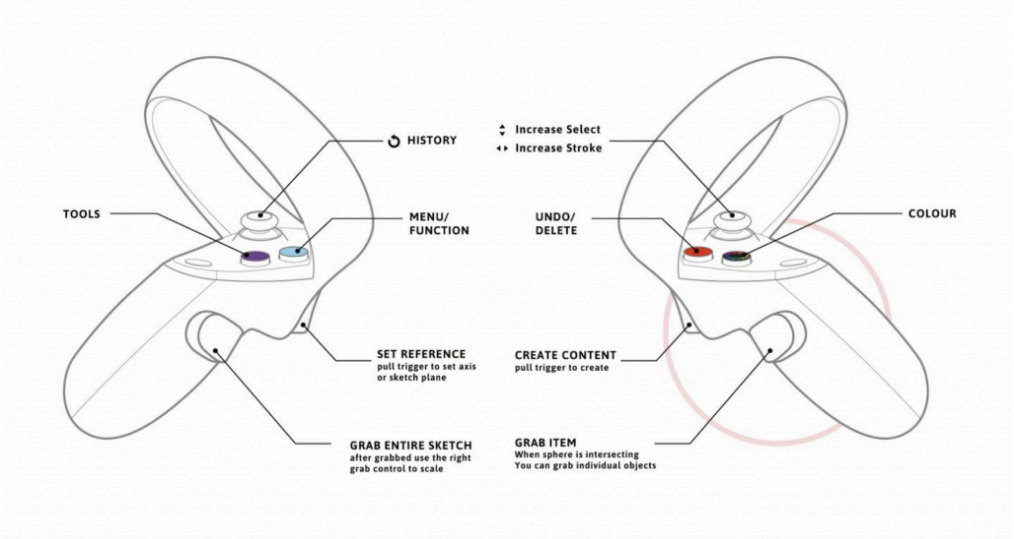
Step 4: Explore Your Space in VR

1. In our VR headset, when in the Lobby, select **File Manager**. You can browse and organize files, and access all your sketches and imported models directly from the File Manager.

2. Create new file: Tap the plus sign to create and enter a new **solo sketch** or **collab room**.
3. You can also import files to Screen Collab in Gravity Sketch by dragging and dropping them from your file system. Supported file types include FBX, OBJ, STL, GLTF, GLB, IGS, IGES, JPG, JPEG, PNG, and MP4. See more instruction about importing files to Gravit Sketch in VR here.
4. Enjoy your exploration in Gravity Sketch VR.

Learn more about controller layout:

Controller Layout:



Controller Functions:

Drawing Hand (originally right hand) – This controller has a grabbing sphere that is used to sketch, move, delete, and modify objects. It also has a color sphere at the front that signifies which color is selected.

Non-Drawing Hand (originally left hand) – This controller is used to move around in space, activate settings menus, and activate tools menus.

Right Hand vs Left Hand:

GravitySketch is right hand dominant by default. However, you can easily swap to left hand dominant by bumping the bottom of the controllers against each other.

Triggers (located on both controllers):

Front Triggers – used to create, point, and select

Grab Triggers – Use to grab, move, rotate, and change the size of objects and the sketch.

Joy Stick:

On Drawing Hand, the joystick is used to change the size of the grab sphere or the size of stroke used for drawing

Color Wheel:

Located on the Drawing Hand, the color wheel is used to change the color and material of objects. Grab and object with the grab sphere and then press the color wheel button to change the color of an object

Menu Button:

The menu button is the blue button on the non-drawing hand. With it, you can access the options and settings.

Tools Button:

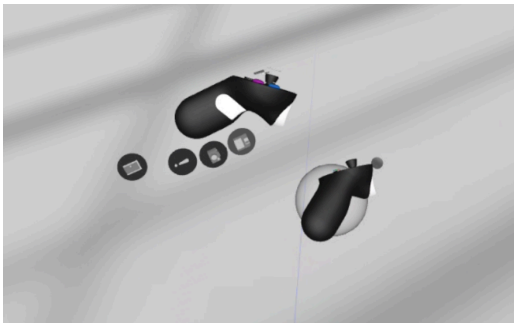
The tools button is the purple button the none-drawing hand. With it, you can access different objects that you can draw. These include but are not limited to strokes, volumes, and primitive objects

Undo Button:

The undo button is located on the drawing hand. Click it to functions much like control-z, it undoes your last action. If you click it while using the grab sphere to select an object, it will delete only that object.

Quick Access Buttons:

These buttons are located on the non-drawing hand when turning the controller outwards.



- Floppy Disk Icon – save your sketch for later access (does not function as an export button)
- Camera Icon – take a screenshot of your image (accessible in LandingPad)
- Exclamation Mark – report an issue
- Door Icon – exit to lobby

See more about the controller layout of Gravity Sketch here.

Options Menu tabs

This is where you will be able to:

A. Access settings and preferences **(Sketching Aid, Preferences, Workspace, Beta)**

B. Save and export your file

C. Import **reference images**

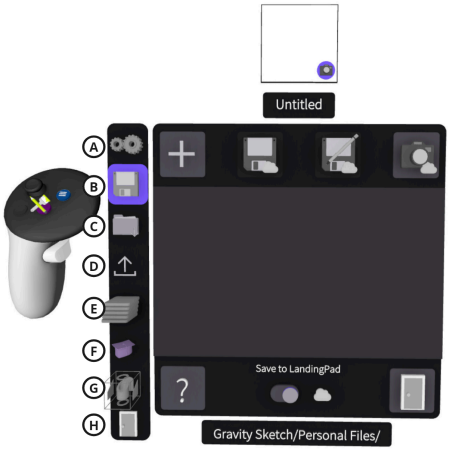
D. Import **prefabs**

E. View your **layers**

F. Access **tutorials and resources**

G. View your **orthographic views**

H. Exit back to the lobby.



See more about the option menu of Gravity Sketch here.

Step 5: Video recording of your exhibition

Method 1: if you are using Tethered VR mode on your computer

You can record your VR view using any computer screen recording software, such as OBS.

Tethered via Oculus Link Set Up

See the video tutorial here.

Download the Oculus PC app (or Steam) on a compatible gaming computer: If you are using Steam then you need to make sure it's allowed to launch from an unknown source: open the Oculus app, go to Settings>General> allow/enable Unknown Sources.

2. Make sure your Quest is turned on. Open Oculus app on your computer > select Devices > Add Headset > Select Link (Cable). Go through the linking process.
3. Once the Oculus Link Setup is complete put on the headset and selects "Allow access to data".
4. Go to the Quick Settings Menu and select Oculus Link.
5. Download the GS app in Meta Store.
6. Launch the app, log in to your LandingPad account and start creating.

To connect your headset via Air Link check the instructions here.

Method 2: if you are using standalone VR in gravity sketch, you can record in your headset

To record video from your Oculus headset:

1. Press on your right Touch controller to open the universal menu.
2. Select Sharing, then select Record Video.

A red dot will appear in VR to indicate that recording has started.

Note: Audio from your headset's microphone will be recorded in the video unless you **mute your microphone.**

To stop recording:

1. Press on your right Touch controller to open the universal menu.
2. Select Sharing, then select Record Video.

Note: You will need to connect the headset to a computer in order to view or share any videos you record.

To access videos on an Oculus Quest 2: Press the home button and Navigate to Sharing > Share Photos.

Videos can also be accessed on a computer by connecting the headset to the computer with a USB-C cable. Once connected, open the Oculus Quest folder, then navigate to VideoShots or Screenshots. From there, the files can be copied and pasted to a desired location on the computer.

Step 6: How to Submit

Submit your video recording with your scanned models here:

Dropbox folder: "Assignment 3_Models_and_Video"

https://www.dropbox.com/scl/fo/r8sfnskc2hgzlceqrsdtc/AJ3T6lpZlyJnSCpKUwN5pNM?rlkey=fiojonmywh6vwqp8kz6aljy1j&st=euzn7b3a&dl=0